Linac PA Task Force

(Report to Proton Plan PMG)

Charge to Linac PA Task Force

- Develop and implement a plan that will to improve the availability of these tubes, including:
- a) build up and maintain an inventory of spare tubes which will support at least two years of operation
- b) work with the manufacturer to increase tube production and testing throughput to a rate of 2 tubes/month
- c) develop the relationship with the tube manufacturer to encourage on-going supply of tubes at the increased rate
- d) identify any improvements in tube performance (i.e. conditions of operation, storage, and conditioning)
- Submit an initial report by February 4,

Visit to Burle

- Czarapata, LoDestro, Morgan & Andrews (20JAN05)
- Summary of steps taken to improve production:
  - Implement a discipline in ordering materials
  - Have located good resources for all critical materials
  - Develop an inventory of sub-assemblies
- Controlling the process:
  - Document the Process and make it available to the workers
  - Hiring additional labor force (maintaining a larger force.)
  - Cross training has become a priority

Visit to Burle (cont.)

- There is a Tube Manufacturer interested in procuring Burle.
- Carl Rintz (Burle President) was not at liberty to say who it was, but they were conducting a “Due Diligence” study at the time of our trip
- This company is interested in expanding their market, and is also interested in the Burle PMT capability
- Burle interested to know if there are other laboratories with the same interest as Fermilab

P.O. with Burle

- Order for 12 tubes placed two weeks ago (PO# 562028)
- Have DOE approval
- Delivery 2/month beginning OCTOBER
  - This will be over and above their current capacity
- Delay because problem w/ Chrome/Cu alloy
  - Purchasing has two buyers looking into this issue

Monitoring Burle Performance

- Items to monitor:
  - Status of material procurement
  - Work on the 2nd Exhaust Station
  - Progress on Lindbergh Furnace Repair
  - Construction progress
  - Any issues w/ ongoing delivery of tubes for supporting Operation
- How to monitor:
  - Checks from Purchasing (procurement activities)
  - 1 to 2 visits over the next 2 to 4 months

Decarburization of Old Tube

Typical Workspace

- Vinnie LoDestro, and Paul Czarapata with Ron Mennier
- Ron Mennier had retired early, and has come out of retirement to help correct the problems with the 7835 line.
- This photo shows the upgraded work space with new equipment and improved cleanliness.

Documenting the Process

- Inspection QA point in the process
- Purpose of this photo:
  - Process documentation using computers
  - Cross-training has become a priority as well.

Assembly Location of 7835 Tube

- Maintaining a clean, dust free environment helps reduce their rejection rate.

Temporary Parts Storage

- Sealed storage with a dry Nitrogen purge.

Quality Control of Grid

- One of the more archaic steps of the process.
- It works but is time consuming.

Lindbergh Furnace

- Required for final assembly of 7835, and needs a re-bricking.
- They have received a PO from Fermilab (~$57K)
- Takes 3 weeks to do the process
- Joe Morgan is chasing the other users to share this cost (since they share the use.)

Exhaust Station

- This station is in use 24/7
- Limit is 1 tube/week
- They said with an order for 12 tubes, they would need to build a second station.
- Burle has procured the parts for the actual station.
- They need to procure the Controls (~$175K)

What's next?

- Part 1 of the charge: Develop enough spares to give a two year inventory of 7835 spares.
- Part 2 of the charge: Develop plans for replacement of Burle tubes should they cease to be a source of PA tubes.
- Strategy:
  - Develop a plan to replace the Linac ($30 to 40 million)
  - Develop a plan to replace the PA Tubes ($10 to 20 million)
  - Build a Test Station (to allow phased replacement ($2 to 4 million)